

## Compact Fluidic Actuator Arrays For Flow Control, Phase I

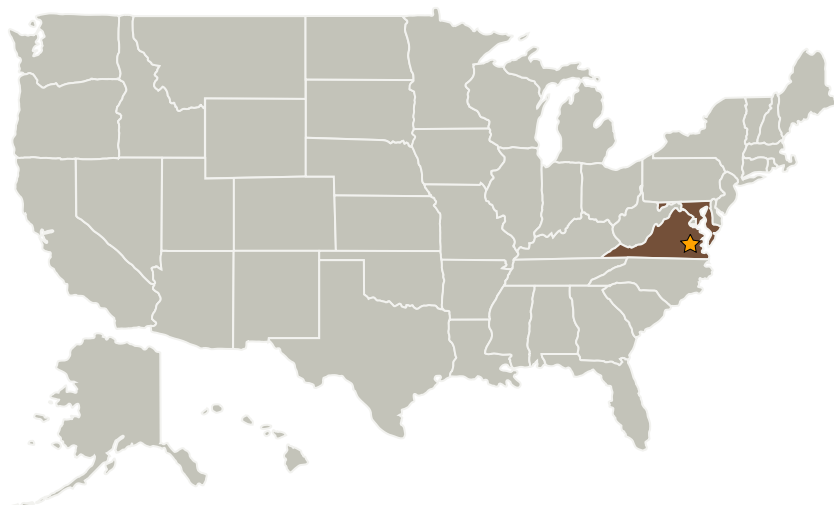
Completed Technology Project (2008 - 2008)



## Project Introduction

The overall objective of the proposed research is to design, develop and demonstrate fluidic actuator arrays for aerodynamic separation control and drag reduction. These actuators are based on a compact design of low mass-flow fluidic oscillators that produce high frequency (1-5 kHz) oscillating or pulsing jets. Our preliminary experiments on separation control over trailing edge flaps, cavity tones and jet thrust vectoring show great promise for these actuators, the main advantage being that these have no moving parts and hence mechanically robust with a high degree of reliability. The control authority of these actuators is also high as measured from the velocity amplitude of the exiting jets. In Phase I of the proposal, we will determine the geometric and dynamic scaling parameters of the fluidic actuators and explore the system integration issues for embedding them into airfoil shapes. Based on the results from this phase, in Phase II, we will design and develop integrated fluidic actuator systems for 1/10 scale to full-scale testing.

## Primary U.S. Work Locations and Key Partners

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For Flow Control, Phase I

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Organizational  
Responsibility**Responsible Mission  
Directorate:**Space Technology Mission  
Directorate (STMD)**Lead Center / Facility:**

Langley Research Center (LaRC)

**Responsible Program:**Small Business Innovation  
Research/Small Business Tech  
Transfer

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Organizations Performing Work	Role	Type	Location
★ Langley Research Center(LaRC)	Lead Organization	NASA Center	Hampton, Virginia
Advanced Fluidics, LLC	Supporting Organization	Industry Small Disadvantaged Business (SDB)	Ellicott City, Maryland

## Primary U.S. Work Locations

Maryland	Virginia
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## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

Carlos Torrez

**Principal Investigator:**

Surya Raghu

## Technology Areas

**Primary:**

- TX01 Propulsion Systems
  - └ TX01.3 Aero Propulsion
    - └ TX01.3.4 Pressure Gain Combustion